

# NASA TECH BRIEF



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## Basal-Plane Metallography of Deformed Pyrolytic Carbon



Cleaved basal-plane surface of pyrolytic carbon deformed by tension (times 100)

### The problem:

To devise better methods of preparation, for metallographic examination of basal-plane surfaces, of samples of well-annealed or hot-worked pyrolytic carbon.

### The solution:

A simple and reliable cleavage technique is recommended. The normal metallographic polishing techniques developed for examination of the microstructures of pyrolytic carbon lead to difficulties when they

(continued overleaf)

are applied to the **basal-plane** surfaces of highly annealed or deformed material. Although this method reveals the proper structure, its appearance is only transient in the course of a sequence of cyclically recurring disturbed structures as a function of polishing time. These disturbed structures result from the progressive loosening, breakup, and removal of thin layers of the basal surface.

Cleavage is a simpler and more reliable technique for preparation of basal-plane surfaces for examination. After careful removal of torn basal-plane fragments and other cleavage debris with cellulose tape, the true structure is clearly revealed. Pyrolytic carbons deformed by tension cleave easily but not cleanly. Tearing is frequent, and the as-cleaved surface is usually cluttered with partially attached fragments.

**Notes:**

1. Mineralogists, metallurgists, or prosthodontists may be interested.
2. There is current interest in the possible use of carbon structures in prosthesis.

3. The following documentation may be obtained from:

The Clearinghouse for Federal Scientific and Technical Information  
Springfield, Virginia 22151  
Single document price \$3.00  
(or microfiche \$0.65)

Reference: NASA CR-10144 (N69-28647), Basal-Plane Metallography of Deformed Pyrolytic Carbon

**Patent status:**

No patent action is contemplated by NASA.

Source: D. B. Fischbach and J. M. Adkins of Jet Propulsion Laboratory under contract to NASA Pasadena Office (NPO-11196)